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Benjamin Franklin's Numismatic Accomplishments

In 1976 the Bicentennial of the Independence of the United States will be celebrated and one of the principal leaders responsible for that change in government was Benjamin Franklin.

It has been said of him that not only did he know more about America than other Americans, but that he knew more about Europe than most Europeans. He was fascinated, knowledgeable and effective in a variety of fields, from the theories about electricity to newspaper editing, from post office management to care of the sick, from philosopher to politician, from skilled negotiator to connoisseur of women. Even though he was a « British colonial » with a formal education which had stopped at age 12, he was respected in Europe as well as America for his many talents and his cooperation with others in the search for knowledge. Among his numismatic accomplishments were a skillful participation in public monetary problems, designs and mottoes for money, production of paper money and combatting the menace of counterfeiting¹.

In Pennsylvania in 1729 there was a difference of opinion as to whether further paper money issues should be authorized for loans to the people. Franklin, then 23 years of age, wrote a pamphlet entitled « A Modest Inquiry into the Nature and Necessity of a Paper Currency », exposing the selfish reasons of the opposition and explaining the general economic benefits to the common man and to the industrial development of the colony. He added a special flavor to paper money by urging that issues secured by land are in effect coined land. The tract was so convincing that Pennsylvania promptly authorized a new issue². Not only was Franklin's writing ability then recognized but as a collateral benefit an opportunity for government printing work opened up for him.

1. E. P. Newman, *Early Paper Money of America*, Racine (1967).

2. M. H. Rothert, Franklin on the Necessity of a Paper Currency, Num. 69, 1956, 1354-1356.
See *Autobiography of Benjamin Franklin*.

As an employé of Samuel Keimer in 1728 Franklin already had had experience in printing paper money for the Colony of New Jersey, having cut and cast ornaments to set with the type and having built and operated the press. His first independent printing contract for paper money was the Pennsylvania issue of 1731. By the time his printing career had ended in 1764 he and the Franklin & Hall partnership had printed fifteen issues of Pennsylvania paper money totaling almost 2,000,000 pieces, nine issues for Delaware totaling over 250,000 pieces, and three issues for New Jersey totaling over 200,000 pieces — which, after adding 2% for spoilage, aggregate about 2,500,000 notes³.

Money Printing Methods

Franklin, as one would expect, was a master in printing paper money in the most efficient manner, minimizing the amount of paper and labor used. During his first two trips to England he worked as a printer and studied European printing techni-

3. Colony	Date	Face Value	No. of Bills*	Remarks
New Jersey	1728	£ 24,760	48,200	Working for Keimer
New Jersey	1737	£ 50,000	126,250	
New Jersey	1746	£ 16,000	40,400	
Delaware	1734	£ 12,000	35,400	Number estimated
Delaware	1739	£ 6,000	49,400	
Delaware	1746	£ 20,000	43,333	Number estimated
Delaware	1753	£ 3,000	24,700	Franklin & Hall
Delaware	1756	£ 2,000	5,900	" "
Delaware	1758	£ 4,000	11,800	" "
Delaware	1758	£ 8,000	23,600	" "
Delaware	1759	£ 27,000	58,500	" "
Delaware	1760	£ 4,000	2,286	" "
Pennsylvania	1731	£ 40,000	75,000	" "
Pennsylvania	1739	£ 80,000	164,000	
Pennsylvania	1744	£ 10,000	92,000	
Pennsylvania	1746	£ 5,000	92,625	
Pennsylvania	1749	£ 5,000	226,667	Franklin & Hall
Pennsylvania	1755	£ 10,000	102,250	" "
Pennsylvania	1756	£ 55,000	185,000	" "
Pennsylvania	1756	£ 30,000	48,000	" "
Pennsylvania	1757	£ 45,000	72,000	" "
Pennsylvania	1757	£ 55,000	88,000	" "
Pennsylvania	1758	£ 100,000	209,145	" "
Pennsylvania	1759	£ 100,000	60,000	" "
Pennsylvania	1759	£ 36,650	9,774	" "
Pennsylvania	1760	£ 100,000	103,036	" "
Pennsylvania	1764	£ 55,000	440,500	" "
TOTALS		£903,410	2,437,766*	

* Excludes customary 2% excess to cover spoilage.

ques extensively. These methods, which he followed and improved in America are well illustrated today by equipment in the Plantin Museum of Printing in Antwerp. His paper stock was of a size that permitted eight faces and eight backs to be printed on one side of one sheet. When such a sheet was laid on the press for printing, two nails pierced the center of the long sides near the edge. After one side was printed and hung up for the ink to dry, the opposite side would be put back on the press using the nail holes for registry and having been rotated so that the faces would be opposite the previously printed backs and vice versa. Thus one printing press could print 16 two-sides notes of eight different denominations on one sheet from type locked in a single chase. He personally, counted and checked the money he printed and was disturbed about a miscount of the 1753 Delaware issue because the boat scheduled to make the delivery down river set sail without giving him time to recount⁴.

Alteration and Counterfeiting

The most severe problem facing an eighteenth century money printer was the alteration and counterfeiting of his products. Methods then used to combat such frauds were generally unsuccessful. The alterations usually consisted of raising the value of a note by eradicating the denominational portions and either drawing in or pasting on a higher value. This could only be done one piece at a time and required the use of genuine notes as a base. It was a common occupational therapy for colonial rascals in the evening. Franklin continued accepted practices to prevent alteration but added one curious countermeasure by spelling the name of the Province of Pennsylvania in four different ways — with one or two n's in the first syllable and with an i or y in the second syllable. Each high denomination had a different spelling so that a raised note might be easily detected by the spelling inconsistency. This might have been an advantage for a Colonial cashier, but since the public was not told the key it was a pointless secret from 1755 through 1776⁵.

Counterfeiting was a much more dangerous menace because once a false engraved plate had been cut or false type had been set, quantities of forgeries could be produced on a press. This was done more safely in Europe or in a colony other than the issuer. Benjamin Franklin concluded as did his brother, James Franklin, that notes printed from set type and special ornaments were more difficult to counterfeit than those from engraved plates. All of the notes Benjamin printed were a combination of set type with special vignettes and ornaments. To deter counterfeiting, Franklin used many of the type founts on hand in his shop so that one bill might have an extensive mixture⁶. One of his greatest inventions, however, was the adaption of

4. *Papers of Benjamin Franklin*, ed. L. W. Labaree, New Haven (1961) Vol. 4, 456.

5. E. P. Newman, *op. cit.* (above n. 1), 240-259.

6. See C. William Miller, *Franklin's Type: Its Study Past and Present*, Proceedings of the Amer-

the nature printing technique to the production of lead printing plates as an anti-counterfeiting device.

Nature Printing

Nature printing is the production of a printed image of a natural object from the object itself. Rolling ink on a botanical specimen and transferring the image to paper by contact had been used by Leonardo da Vinci at the end of the 15th century. In Philadelphia from 1731 through 1742 Joseph Breintnall, a friend of Franklin, was making such prints of superb quality for botanical purposes ⁷.

Franklin realized that no leaf was identical to another and therefore any selected leaf could not be perfectly duplicated. He recognized that the complexity of leaf surface structure was ideal for preventing counterfeiting if a natural leaf design could be printed on a piece of paper money. The only problem he faced was how to do it. Electrotyping, acid engraving, lithography, and photography were not to be developed for years into the future. Franklin invented a way, and kept it a secret. It was related to stereotyping.

Stereotyping was discussed in Europe in the early part of the eighteenth century because of the large quantity of lead type needed to set a long book. There was also a need to retain that set type for reprintings or revisions. It was realized that if a negative could be made in one piece for an entire page of type and a positive casting made from that negative, the individual letters and figures would immediately be released for reuse. The difficulty was that a large negative of set type could only be precisely formed with plaster and the subsequent pouring of hot lead into that plaster negative would break it. During Franklin's early trips to England he probably learned of this problem. Apparently he never met William Ged of Edinburgh who made one such stereotype page in 1725 in London and worked on the problem thereafter. In 1736 Ged achieved his goal by completing all of the stereotype plates for *On the Gods and the World* by Sallustius Crispus. This book was finally printed in 1739. On the title page is William Ged's simple explanation in Latin that plates were used instead of movable type. A stereotyped plate used in printing that book is in the City Museum of Edinburgh.

Franklin, in his November 11, 1736 Pennsylvania Gazette was proud to advertise his publication of *Poor Richard's Almanac* for 1737 as containing « a particular Description of the Herb which the Indians use to cure the Bite of that venomous Reptile a Rattle-Snake » and « an exact Print of the Leaf of the Plant ». In the al-

ican Philosophical Society 99, 1955, 418-432 ; *Papers of Benjamin Franklin*, (see above n. 4) vol. 13, 60 and 99, also Vol. 14, 17.

7. E. P. Newman, *Nature Printing on Colonial and Continental Currency*, Num. 77, 1964, 147-154, 200-305, 457-465, 613-623.

manac Franklin had printed a perfect reproduction of a rattlesnake leaf for educational purposes, but little did his readers realize the process of reproduction he had used.

From an examination of the leaf prints on the back of paper currency issues printed by Franklin and his successors it is evident that a lead plate was used for printing that part of the back. On the 10 shilling Pennsylvania notes there are small white dots near the lower left and upper right corners of the birch leaf print. On some examples the upper right corner of the print shows a defect. The dots are obviously holes caused by nailing a lead plate to a wood block and the corner defect was clearly caused by such a nail breaking off the corner of the plate. In the background of the leaf design is a perfect image of a piece of cloth, the irregularities in the thread and in the weaving being very evident. Some of the cloth faintly shows through portions of the leaf design. Since the high portions of the leaf and cloth are the black portions of the print a transfer through a negative had to be made to reproduce the design. The high points of the leaf and cloth had to be on the same level for a flat uniform printing impression to be made.

Wet paper or wet earth were placed in a small shallow container and pressed flat. Then a wet piece of fabric was laid on that surface. A fresh leaf or sprig then was laid on the cloth. A flat block of wood was pressed or tapped against the top surface of the leaf and the exposed part of the cloth, forcing the leaf down to the level of the cloth surrounding it. To make a pure plaster negative of this combination was simple but the problem was to make a negative of this size strong enough not to fracture from the heat, when a lead positive was made from it. Franklin must have first added brick dust, pulverized asbestos or refractory clays to the plaster and after it had set he could have baked out much of the moisture in the mold. The negative mold was then used to cast a thin positive lead plate from which the leaf and cloth design could be printed⁸. Additional castings were usually taken from the same negative for multiple or substitute usage. Thus a threedimensional natural object could be reproduced with full accurate detail by letter press printing in the eighteenth century.

Nature prints had given such major protection to the currency issues of the four colonies which used them that the practice was adopted for the first money of the United Colonies at the outbreak of the American Revolution. After Franklin's death his nature printing plate art was apparently never used again and remained a secret. Electroplating, chemical etching and photography destroyed its uniqueness as a printing method.

8. Experiments conducted by Ivy N. Steele, Chicago, Illinois.

One Uniform Paper Currency

In its statutory regulation of American paper currency, England prohibited any further issues with legal tender status as to New England in 1751 and as to all colonies in 1764. This was the result of extensive inflation in some colonies although there was little fluctuation in the value of the Pennsylvania, New Jersey and Delaware paper money which Franklin had printed. In anonymously opposing both the 1764 Currency Act and the 1766 Stamp Act, Franklin urged one uniform paper currency with mortgage loan security be established for the American colonies as a whole in lieu of separate paper money for each colony. He opposed interest bearing money and favored sinking fund redemption through taxes⁹. His ideas were first ignored in England by the representatives of the Crown, were then deemed too radical, and in due course viewed as too conservative by his fellow Americans.

None of his efforts met fruition until the American Continental Congress issued a uniform paper currency to support the Revolutionary cause.

Poor Richard's Mottoes

Those publications which Franklin wrote or edited demonstrated his belief in influencing human conduct with philosophic truisms and stimulating mottoes. Poor Richard's sayings required Franklin to seek compilations of such material in European publications. During the Colonial period the Crown would not have permitted anyone to so enliven paper money, but the Continental paper money issued during the Revolution had a different emblem and motto on the face of each denomination.

Numismatists suspected that Franklin, being one of the committee of five appointed to prepare paper money, might have participated in the emblem and motto matter but until a few years ago nothing about those devices had been located. It was known that Francis Hopkinson had unsuccessfully claimed a quarter cask of public wine as extra compensation from the government for developing seven unidentified devices for the currency. A search for what emblem and motto books happened to be in Philadelphia in 1775 showed that such books by Joachim Camerarius and Diego Saavedra, were in Franklin's library. The location in those books of all of the emblems and mottoes used on 1775 Continental Currency indicated that Franklin had been the source. In 1776 two new devices appeared on the fractional currency issue. The device on the face was a rebus « Time flies so Mind Your Business ». In 1758 Poor Richard had used a similar saying which might be even more applicable today, namely, « In a Corrupt Age the Putting the World in Order Would Breed Confusion, Then e'en Mind Your Own Business ». In 1748 he had said « Lost time is never found ». The device on the back of the fractional notes was a continuous

9. *Papers of Benjamin Franklin*, (see above n. 4) 13 Vol., 207; also Vol. 14, 32 and 77.

circular chain of thirteen links with the motto, « American Congress We are One ». These two devices must have pleased Franklin particularly and the designs were reused on the proposed 1776 Continental Currency coinage pattern and on the first official copper coinage of the United States in 1787¹⁰. It has been further recommended for inclusion on coin or paper money to be issued in commemoration of the Bicentennial of the Independence of the United States in 1976.

Franklin's mission to France, beginning in 1776, did not prevent him, in 1779, from suggesting many mottoes for contemplated copper coinage of the United States. He wanted « some important proverb of Solomon, some pious, moral, prudential or economical precept, the frequent inculcation of which on seeing it every time one receives a piece of money might make an impression upon the mind ». He wanted other coinage designs to show « different species of barbarity with which the English have carried on the War in America, expressing every abominable circumstance of their cruelty and inhumanity »¹¹. Unfortunately, the copper coinage program was abandoned and his unusual suggestions could not be considered.

Additional Ideas for Coinage

Franklin's influence is also present in the symbols which appeared on the first coinage of the United States Mint in 1793. On the cents and half cents the female Liberty Head with flowing hair and the French Liberty Cap on a pole, were copied from the 1783 *Libertas Americana* medal designed by Augustin Dupré in France at Franklin's instigation¹².

Currency Depreciation as a Tax

Franklin accepted the collapse in value of Continental Currency as one of the costs of the War of Independence. When this paper money was approaching worthlessness in 1781 he pointed out « Paper Money not being easily received out of the Country that makes it, if the Quantity becomes excessive, the Depreciation is quicker and greater ».

One cannot but realize the timelessness of those remarks.

In his letters he wrote « This currency, as we manage it, is a wonderful Machine. It performs its Office when we issue it ; it pays and clothes Troops, and provides Victuals and Ammunition ; and when we are obliged to issue a Quantity excessive, it pays itself off by Depreciation ». « But this Depreciation, tho' in some Circum-

10. E. P. Newman, *Sources of Emblems and Mottoes on Continental Currency and the Fugio Cent*, Num., 79, 1966, 1587-1598.
11. E. P. Newman, *Poor Richard's Mottoes for Coins*, Num., 69, 1956, 1363-1367.
12. E. G. Bradfield, *Benjamin Franklin, a Numismatic Summary*, Num., 69, 1956, 1351.

stances inconvenient, has had the general good and great Effect of operating as a Tax, and perhaps the most equal of all Taxes, since it depreciated in the Hands of the Holders of Money, and thereby tax'd them in proportion to the Sums they held and the time they held it which generally is in proportion to Men's Wealth »¹³.

Bank of North America Scrip

The final involvement of Franklin in money production was to help the Bank of North America solve the copper coinage crisis of July, 1789. The States had since 1785 coined immense quantities of unredeemable coppers which circulated far above their intrinsic worth. To this, additional quantities of English halfpence, genuine and counterfeit, had been recently imported or secretly produced in America. When merchants hesitated to accept all of these coppers at customary rates the population panicked and small trade was paralyzed. At this point Franklin suggested to the Bank of North America that the bank introduce small paper notes into circulation redeemable in specie with denominations of 1/90th and 3/90ths of a Spanish dollar. Franklin also furnished two reams of white rag paper with a marbled edge for printing them¹⁴.

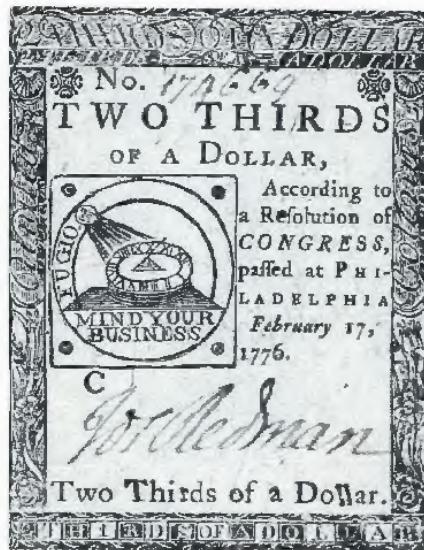
Thus Franklin devoted a full sixty years of his life to « making money more plentiful »¹⁵.

Note: The explanation of *pl. 70-71* is given in the captions.

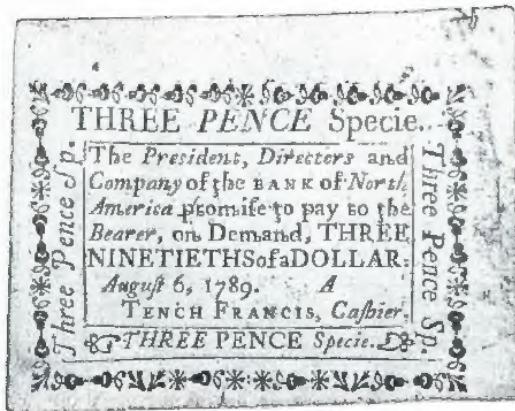
13. Letter to Samuel Cooper dated April 22, 1779 ; letter to Thomas Ruston dated October 9, 1780.
14. E. P. Newman, *Franklin and the Bank of North America*, Num., 69, 1956, 1368-1370.
15. E. P. Newman, *Franklin Making Money More Plentiful*, Proceedings of the American Philosophical Society, 115, No. 5, 1971.



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